REMARKS

Claims 20-21 are pending in this application. By this Amendment, claim 20 is amended. Support for the amended claim can be found, at least, in FIG. 1 and on pg. 10, lines 1-22, pg. 11, lines 16-20, pg. 12, lines 24-26, pg. 4, lines 1-20, pg. 5, lines 14-23, and pg. 13, lines 20-25. No new matter is added.

Applicants appreciate the courtesies shown to Applicants' representatives by Examiners Chen and Kackar in the April 2, 2009 personal interview. Applicants' separate record of the substance of the interview is incorporated into the following remarks.

Claims 20 and 21 are rejected under 35 U.S.C. §112, first paragraph because allegedly there is lack of support for the claimed feature "maintaining the maximum depth to be less than 0.4 mm." This rejection is respectfully traversed.

As discussed during the interview, the rejected feature has been removed without prejudice to or disclaimer of the subject matter recited therein. Accordingly, this rejection is moot. Withdrawal of the rejection is respectfully requested.

Claims 20 and 21 are rejected under 35 U.S.C. §103(a) over Japanese Patent Publication No. JP 2000-355766 to Kokusai in view of U.S. Patent No. 5,088,697 to Murakami, newly cited U.S. Patent Application Publication No. US2002/0066412 to Yao et al. and newly cited U.S. Patent No. 5,303,574 to Matossian et al. This rejection is respectfully traversed.

As admitted on pages 4-5 of the Office Action, Kokusai fails to teach providing a silicon single crystal substrate of 300 mm or more, fails to teach a susceptor having only a heat-treated body formed of graphite and coated with SiC, and fails to have reduced slip dislocation frequency. Also, instead of having a susceptor being warped in an inverted U-shape by heat treatment, Kokusai is manufactured by a Zagury process (machining).

Claim 20 is further amended to recite that vapor phase growth is performed by "heating the substrate from above and from below." As discussed during the interview, this is supported, for example, by Fig. 1, pg. 10, lines 1-7, pg. 11, lines 16-20, and pg. 12, lines 24-26.

In Kokusai, the substrate is heated from only below. Therefore, as described in paragraph [0017] of Kokusai, the susceptor is always warped in a concave ("U") shape. It is considered that the temperature of the rear surface of the susceptor is higher than that of the front surface thereof and that the rear surface is thermally expanded more than the front surface. In Kokusai, the pocket of the rear surface of the susceptor is one for flattening the rear surface when the susceptor is warped in a concave shape.

On the contrary, in the growth method of claim 20, the silicon single crystal substrate is heated from above and from below. Therefore, to one of ordinary skill in the art, it is uncertain which direction the susceptor may warp.

However, Applicants have found that if warpage (U-shaped) occurs and the pocket depth increases, an increase in undesirable slip dislocation frequency can occur. Moreover, if warpage occurs in an inverted U-shape, pocket depth decreases, which has been found to not affect slip dislocation frequency as shown in Applicants' Table 1. As discussed during the interview, based on this understanding, Applicants recognized that if a susceptor is selectively chosen that has already undergone heat treatment and has been found to result in an initial warpage of the body section in an inverted U-shape (Fig. 2A), any warpage that occurs during subsequent vapor growth processing will also occur in this same predisposed direction. Thus, any warpage from this type of susceptor will result in a decrease in pocket depth due to the warpage, which will ensure reduction of slip dislocation frequency even when vapor phase growth is achieved using a process that heats from both above and from below.

As further evidence of this, Applicants refer the Examiner to the below Table, in which data for examples 1-5 correspond to that from Table 1 in Applicants' specification and examples 6-18 are additional examples showing a comparison of U-shaped and inverted U-shaped warping and the occurrence of slip dislocation.

In the case of a susceptor warped in an inverted U-shape during heat treatment, slip dislocation does not occur. Of note is data from example 17 where slip dislocation was found not to occur, even though the pocket in example 17 is deeper than that of example 4. The susceptor in example 17 is warped in an inverted U-shape while the susceptor in example 4 is warped in a U-shape.

No.	1	2	3	4	5	6	7	8	9
Warp	Inv.U	Inv. U	Inv. U	U	U	U	U	U	U
Depth	0.23	0.32	0.38	0.48	0.53	0.54	0.54	0.64	0.54
Slip	OK	OK	OK	NG	NG	NG	NG	NG	NG

No.	10	11	12	13	14	15	16	17	18
Warp	U	U	U	U	Inv. U	Inv. U	Inv. U	Inv. U	Inv. U
Depth	0.59	0.59	0.54	0.69	0.44	0.44	0.39	0.49	0.44
Slip	NG	NG	NG	NG	OK	OK	OK	OK	OK

Table

It is believed that the depth of the pocket relates to the occurrence of slip dislocation. Slip dislocation occurs because the temperature difference caused in the surface of the

substrate is large. When the pocket is deep, the space between the bottom of the pocket and the center of the substrate is large. As a result, the substrate cannot be uniformly heated.

In example 17, because the susceptor is warped in the inverted U-shape during epitaxial phase growth, the pocket becomes shallower than that of example 4. Therefore, even though the pocket was initially deeper than example 4, after phase growth it has become reduced due to the inverted U-shaped warpage so as to reduce slip dislocation.

Kokusai fail to teach epitaxial phase growth by heating from above and from below and fails to recognize the advantages achieved by selecting and using a susceptor that has been formed by heat treatment to warp in an inverted U-shape to ensure slip dislocation frequency reduction.

During the interview, the Examiner acknowledged that Kokusai was not formed to have an inverted U-shape during a heat treatment step.

As generally agreed upon during the interview, Kokusai fails to teach (1) heat treatment, (2) selection, and (3) formation with reduced slip dislocation frequency. At the request of the Examiners, independent claim 20 is revised to even further clarify these features.

As also discussed during the interview, Murakami, Yao and Matossian fail to appreciate this problem or its solution. Murakami is only relied upon for use of graphite. Yao has no appreciation of warpage and fails to heat the substrate from above and below as claimed. Matossian is relied upon for a general teaching of evaluating wear and is directed to non-analogous art.

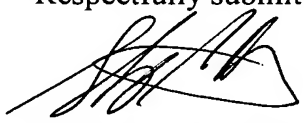
Murakami, Yao and Matossian thus fail to overcome the deficiencies of Kokusai with respect to independent claim 20.

Therefore, claim 20 and claim 21 dependent therefrom distinguish over Kokusai, Murakami, Yao and Matossian and are allowable.

In view of the foregoing, it is respectfully submitted that this application is in condition for allowance. Favorable reconsideration and prompt allowance of claims 20-21 are earnestly solicited.

Should the Examiner believe that anything further would be desirable in order to place this application in even better condition for allowance, the Examiner is invited to contact the undersigned at the telephone number set forth below.

Respectfully submitted,



William P. Berridge
Registration No. 30,024

Stephen P. Catlin
Registration No. 36,101

WPB:SPC/hlp

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OLIFF & BERRIDGE, PLC
P.O. Box 320850
Alexandria, Virginia 22320-4850
Telephone: (703) 836-6400

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